Appendix J

Original Alternative 2

(prior to public review)

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1.0 Alternative 2 – Dredged Material Placement with Seasonal Wetlands

1.1 Restoration Features

Alternative 2 consists of the authorized Project and the BMKV increment, as described prior to the public comment period. Figure J-1 depicts Alternative 2 at maturity. Under Alternative 2, a diverse array of tidal (tidal marsh, tidal flat, subtidal) and nontidal (high-transitional marsh, seasonal wetlands, upland) habitat types would be restored to the expansion site. Imported dredged material that has been determined to be suitable wetland cover according to DMMO requirements would be used to create upland and seasonal wetland habitats, and to create surface elevations suitable to accelerate the initial establishment of tidal marsh vegetation. Final marsh plain elevations would develop over time through the natural deposition of sediments from San Pablo Bay, supporting the establishment of tidal marsh vegetation.

In the eastern portion of the BMKV parcel, two tidally influenced sub-basins, each approximately 600 acres in size, would be created as cells to facilitate the placement of dredged material and the establishment of tidal wetland vegetation. Dredged material would be placed in each sub-basin to create surface elevations ranging from approximately 2 feet NGVD (approximately 1 foot below MHW) along the basin perimeter to 0 NGVD near the outboard levee. Additional dredged material would be placed in the southeast corner of the BMKV parcel to create surface elevations (approximately 3.5 feet NGVD) suitable for the establishment of high-transitional marsh vegetation. After placement activities have been completed, the outboard levees would be breached in two locations to restore the hydrologic connections to San Pablo Bay and Novato Creek. The levee along Novato Creek would also be lowered to facilitate overflow onto the expansion site from Novato Creek during peak storm events. The levee along San Pablo Bay would also be lowered to create topographic diversity and facilitate the establishment of high-transitional marsh vegetation. Final marsh plain elevations would be established through the deposition of fine-grained sediments from San Pablo Bay and Novato Creek. Final surface elevations in the two marsh sub-basins would range from approximately 0.5 to 3.5 feet NGVD. Elevations in the channel bottoms would ultimately be lower, particularly at the breach.

A levee would be constructed across the northwestern portion of the BMKV parcel to separate the non-tidal and tidal habitats. The outboard (east) side of the levee would be constructed with a gentle side slope that would transition from upland to high- to mid-marsh habitat types. The inboard (west) side of the levee would slope gradually from the crest at 10 feet NGVD to a base elevation 1 foot NGVD. The existing levee along the BMK south lagoon would be improved (approximate top elevation of 6 feet NGVD) and an overflow structure or structures would be installed to convey overflow into the swale area. Overflow from the lagoon as well as seasonal precipitation would support the

establishment of approximately 40 acres of seasonal wetland habitat in the swale located between the two levees. Plant species composition in this area would vary according to salinity and inundation frequency and duration; however, vegetation would likely consist of emergent wetland vegetation (e.g., bulrushes, cattails, rushes), and grasses and forbs.

In the northwestern portion of the BMKV parcel, approximately 170 acres of seasonal freshwater wetlands would be created by constructing a levee to impound freshwater flows. The levee would also prevent the seasonal wetland habitat area from being inundated during high tides. An adjustable weir would be installed in the existing Pacheco Pond levee to facilitate overflow into the seasonal wetland habitat area when surface water elevations in Pacheco Pond exceed the managed surface water elevation. A culvert structure would be installed in the new levee to allow the release of overflow waters from the seasonal wetlands into the tidal marsh basin. A significant portion of Pacheco Pond flood flows may be released into the seasonal marsh area and from there into the tidal marsh basin.

As for Alternative 1, the salinity of the water in the channel flowing through the tidal marsh basin would vary, depending on the outflow from Pacheco Pond and the extent of tidal inundation. As water is released from Pacheco Pond following large winter storm events, salinities within the channel would vary from freshwater values near the overflow to brackish and marine levels as water flows into the marsh basin. During extreme high tides, the channel would be inundated by tidal flow and salinity would increase to near marine levels. The seasonal wetlands would not be affected during these periods because the flapgate would prevent tidal flows from entering the pond. During the summer months and dry times of the year, the salinity of water in the channel would be comparable to that found in San Pablo Bay.

Under this alternative, a new or retrofitted outfall pipeline would be installed along the berm (the existing alignment) that separates the BMKV parcel from the adjacent HAAF parcel. The existing pipeline would be replaced or retrofitted because of differential settling and leakage. The new pipeline would be installed slightly below the grade of the existing pipeline; the existing outfall pipeline would be abandoned in place to provide protection from scour associated with the formation of tidal channels.

1.2 Recreation Features

Under this alternative, the Bay Trail would be extended southward from the terminus of the existing trail at the pump station near the Hamilton baseball field, along the southwestern perimeter of the HWRP to a point approximately 700 feet from the existing outboard marsh. This trail alignment is similar to that described for Alternative 1. Public access would also be provided by a trail that follows the existing Pacheco Pond levee, connecting the proposed Bay Trail segment along the southwest boundary of the HAAF parcel to Bel Marin Keys Boulevard. A permanent bridge would be installed to facilitate access across the new weir structure. An optional spur of the Bay Trail would be located along the proposed levee separating the upland buffer/swale area from restored tidal wetlands. This spur would terminate at Novato Creek, and a gate would be installed at the Novato Creek terminus to prevent trail users from entering the BMK residential area.

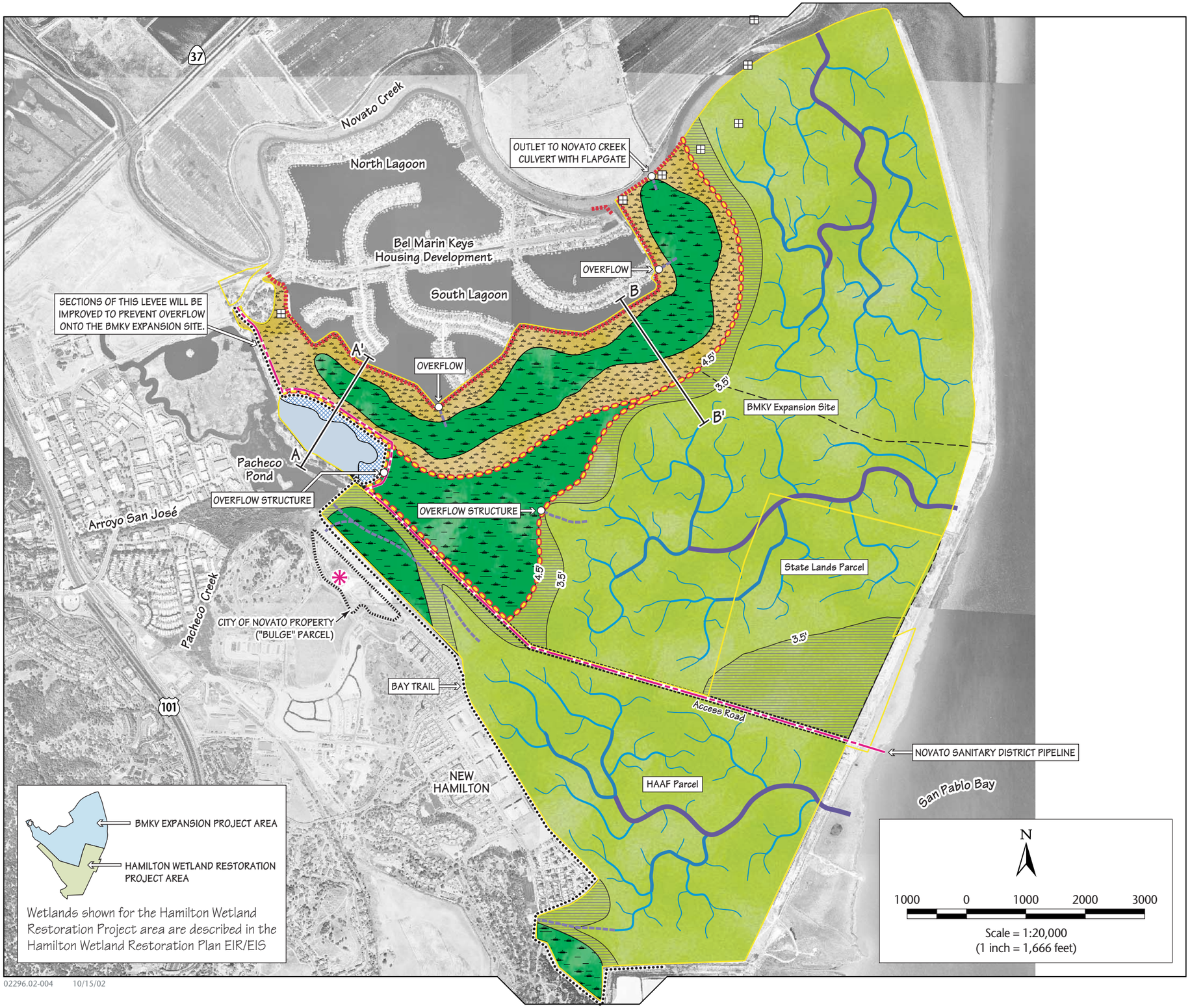
In addition, under this alternative, an interpretive center for the HWRP and BMKV expansion would be constructed on the northwestern portion of the BMKV parcel, south of Bel Marin Keys Boulevard. A paved road would connect the center to Bel Marin Keys Boulevard. The interpretive center is conceptually envisioned as an approximately 1,000-square foot building housing exhibits that provide information about the wetland restoration projects and the local flora and fauna. Restrooms and limited parking (10-20 spaces) would be provided. The interpretive center would serve as a trailhead and would be connected to the proposed Bay Trail alignment via new trails routed along existing dirt roads. The interpretive center is not a part of the federal project, and as such would be the full responsibility of the non-Federal sponsor.

1.3 Summary of Changes to Authorized HWRP

The following changes to the authorized HWRP will occur if Alternative 2 is implemented:

- Elimination of levee between BMKV and SLC parcels
- Replacement of levee between HAAF and SLC parcels with an access berm
- Repositioning of the breach location off the SLC parcel
- Increase and change in location of high transitional marsh on the SLC parcel.

Figure J-1
Bel Marin Keys Restoration
Alternative 2 at Maturity



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Legend

HABITAT TYPES

- Upland Transition
- Freshwater Emergent Wetland
- Seasonal Wetland
- High Transitional Marsh
- Tidal Salt Marsh
- Open Water

CHANNEL ORDER

- Primary channels
- Secondary channels
- Tertiary channels
- Small branches
- Sub-basin Boundary

INFRASTRUCTURE

- Parcel Boundary (see inset)
- Overflow Channel and Structure
- New Levee
- Improved Levee
- Existing Levee
- Bay Trail
- Power Tower
- Novato Sanitary District Pipeline
- Interpretive Center
  (access area adjacent, not shown)

Notes:

Vertical elevations are relevant to NGVD 1929.

Sections of the levee north of Pacheco Pond will be improved to prevent overflow onto the BMKV expansion site.

See Figure 3-6 for cross sections A–A' and B–B'.

Coastal Conservancy

Jones & Stokes

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